

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of forming an anti-microbial wiper capable of providing a liquid anti-microbial solution after multiple rinse cycles, the method comprising the steps of:

providing a controlled release anti-microbial formulation comprising an anti-microbial agent and a ~~cross-linked polymer that comprises at least one compound~~ selected from the group consisting of acrylate[[s]] polymers, styrene butadiene polymers, vinyl chloride[[s]] polymers, methacrylate[[s]] polymers, acrylic[[s]] polymers, ~~carboxylated acrylic latexes~~, vinyl acetate[[s]] polymers, and mixtures thereof, wherein said polymer is cross-linkable; and

adhering said formulation to an absorbent web containing fibers; and

cross-linking said polymer;

wherein said, which web retains liquid after each rinse cycle, and wherein said ~~which~~ formulation releases sufficient anti-microbial agent into the retained liquid after each of at least five normal rinse cycles so that the retained liquid is an anti-microbial solution and said retained liquid is capable of disinfecting a hard surface that is wiped with said anti-microbial wiper.

2. (Cancelled)

3. (Previously Presented) A method as defined in claim 1, wherein said cross-linked polymer is capable of swelling upon exposure to water such that the degree of swelling of said cross-linked polymer at least partially controls said release of said anti-

microbial agent.

4. (Currently Amended) A method as defined in claim 3, wherein said ~~cross-~~linked polymer is a carboxylated acrylic latex.

5. (Cancelled)

6. (Original) A method as defined in claim 1, wherein said anti-microbial formulation comprises a source of anti-microbial metal ions.

7. (Original) A method as defined in claim 6, wherein said anti-microbial formulation comprises a source of ions of a metal selected from the group consisting of silver, copper, zinc, mercury, antimony, lead, bismuth, cadmium, chromium and thallium.

8. (Original) A method as defined in claim 7, wherein said metal comprises silver.

9. (Original) A method as defined in claim 1, wherein said anti-microbial formulation comprises a source of free chlorine.

10. (Original) A method as defined in claim 1, wherein said anti-microbial formulation comprises calcium hypochlorite particles.

11. (Original) A method as defined in claim 1, wherein said anti-microbial formulation comprises a quaternary ammonium compound.

12. (Original) A method as defined in claim 11, wherein said quaternary ammonium compound comprises alkyl aryl benzonium chloride.

13. (Currently Amended) A method as defined in claim 1, wherein said antimicrobial formulation ~~polymer or cross-linked polymer~~ further comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a

plasticizer, a defoamer, a colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

14. (Original) A method as defined in claim 1, wherein the adhering of said anti-microbial formulation comprises spraying the formulation onto said web.

15. (Original) A method as defined in claim 1, wherein the adhering of said formulation onto said web comprises a process chosen from the group consisting of printing, blade applying, coating, droplet throwing, print creping, saturating, and foam applying.

16. (Original) A method as defined in claim 1, wherein said web has at least two surfaces, said formulation being applied to said at least one of said two surfaces of said web in a pre-selected pattern.

17. (Original) A method as defined in claim 16, wherein said formulation covers from about 10% to about 60% of said at least one surface of said web.

18. (Currently Amended) A method as defined in claim 4 16, wherein said formulation covers from about 20% to about 40% of said at least one surface of said web.

19. (Original) A method as defined in claim 16, wherein said formulation covers from about 10% to about 60% of both surfaces of said web.

20. (Currently Amended) A method as defined in claim 1, wherein said polymer is cross-linked ~~further comprising the step of curing said polymer~~ after said formulation has been applied to said web.

21. (Previously Presented) A method as defined in claim 16, further comprising the step of creping said at least one surface of said web to soften said web after said

formulation has been applied to said web.

22. (Original) A method as defined in claim 1, wherein said fibers of said web comprise pulp fibers.

23. (Original) A method as defined in claim 1, wherein said fibers of said web comprise synthetic fibers.

24. (Currently Amended) A method of forming an anti-microbial wiper for disinfecting hard surfaces comprising the steps of:

providing a cloth-like absorbent base web containing fibers and capable of retaining liquid after a rinse cycle, said absorbent web having two outer surfaces; and
adhering an anti-microbial formulation to said absorbent web, said anti-microbial formulation comprising an anti-microbial agent and a polymer ~~or cross-linked polymer that comprises at least one compound~~ selected from the group consisting of acrylate[[s]] polymers, styrene butadiene polymers, vinyl chloride[[s]] polymers, methacrylate[[s]] polymers, acrylic[[s]] polymers, ~~carboxylated acrylic latexes~~, vinyl acetate[[s]] polymers, and mixtures thereof, wherein said polymer is cross-linkable; and said anti-microbial formulation containing an anti-microbial agent

cross-linking said polymer;

wherein said anti-microbial agent is being capable of activation when said absorbent web is contacted with a liquid, said activation including the release of a portion of said anti-microbial agent into the retained liquid to form an anti-microbial solution, said cross-linked polymer being capable of controlling the rate of release of the anti-microbial agent from the anti-microbial formulation so that said anti-microbial solution is formed after at least five rinse cycles and said retained liquid is capable of

disinfecting a hard surface that is wiped with said anti-microbial wiper.

25. (Currently Amended) A method as defined in claim 24, wherein said ~~cross-linked polymer~~ antimicrobial formulation further comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a plasticizer, a defoamer, a colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

26. (Currently Amended) A wiper capable of providing liquid anti-microbial solution after numerous rinse cycles comprising:

a controlled release anti-microbial formulation comprising an anti-microbial agent and a ~~cross-linked polymer that comprises at least one compound~~ selected from the group consisting of acrylate[[s]] polymers, styrene butadiene polymers, vinyl chloride[[s]] polymers, methacrylate[[s]] polymers, acrylic[[s]] polymers, ~~carboxylated acrylic latexes~~, vinyl acetate[[s]] polymers, and mixtures thereof, wherein said polymer is cross-linked, which formulation is adhered to

an absorbent web which retains liquid after each rinse cycle,

wherein said ~~which~~ formulation releases sufficient anti-microbial agent into the retained liquid after each of at least five normal rinse cycles so that the retained liquid is an anti-microbial solution and said retained liquid is capable of disinfecting a hard surface that is wiped with said anti-microbial wiper.

27. (Cancelled)

28. (Previously Presented) A wiper as defined in claim 26, wherein said polymer comprises a carboxylated acrylic latex.

29. (Cancelled)

30. (Original) A wiper as defined in claim 26, wherein said anti-microbial agent comprises a source of metal ions where the metal is selected from the group consisting of silver, copper, zinc, mercury, antimony, lead, bismuth, cadmium, chromium and thallium.

31. (Original) A wiper as defined in claim 30, wherein said metal comprises silver.

32. (Original) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises a source of free chlorine.

33. (Original) A wiper as defined in claim 26 wherein said anti-microbial formulation comprises a source of chlorine dioxide.

34. (Currently Amended) A wiper as defined in claim ~~26~~ 32, wherein said anti-microbial formulation comprises calcium hypochlorite particles.

35. (Original) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises a quaternary ammonium compound.

36. (Currently Amended) A wiper as defined in claim ~~35~~ 28, wherein said quaternary ammonium compound comprises alkyl aryl benzonium chloride.

37. (Currently Amended) A wiper as defined in claim ~~26~~ 27, wherein said ~~polymer~~ antimicrobial formulation further comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a plasticizer, a defoamer, a colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

38. (Original) A wiper as defined in claim 26, wherein said formulation covers from about 10% to about 60% of said at least one surface of said web.

39. (Original) A wiper as defined in claim 26, wherein said formulation covers from about 20% to about 40% of said at least one surface of said web.

40. (Original) A wiper as defined in claim 26, wherein said formulation covers from about 10% to about 60% of both surfaces of said web.

41. (Original) A wiper as defined in claim 26, wherein said fibers of said web comprise pulp fibers.

42. (Original) A wiper as defined in claim 26, wherein said fibers of said web comprise synthetic fibers.